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DECLARATION STATEMENT - RECORD OF DECISION - OPERABLE UNIT ONE
STANDARD AUTO BUMPER SITE

Site Name and Location
Standard Auto Bumper Site
Hialeah, Dade County, Florida

Statement of Basis and Purpose

This decision document presents the selected remedial action for the Standard Auto Bumper site, in Hialeah, Dade County, Florida, which was chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) and to the extent practicable, the National Oil and Hazardous Substance Pollution Contingency Plan. This decision is based on the administrative record for this site. The State of Florida, as represented by the Florida Department of Environmental Regulation (FDER), has been the support agency during the Remedial Investigation and Feasibility Study process for the Standard Auto Bumper site. In accordance with 40 CFR 300.430, as the support agency, FDER has provided input during this process. Based upon comments received from FDER, it is expected that concurrence will be forthcoming; however, a formal letter of concurrence has not yet been received.

Assessment of the Site

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in the Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment.

Description of the Selected Remedy

The response action described in this document represents the first of two planned operable units for the site. This remedy addresses the source of contamination, the soils. A prior removal action in 1989 entailed the removal of contaminated waste from an underground trench and contaminated soils surrounding the Standard Auto Bumper facility. Remaining contaminated soils are the existing threat at the site. The second operable unit will address groundwater.

The major components of the selected remedy include the following:

- Excavation of approximately 2500 cubic yards of soils contaminated with nickel, total chromium, or hexavalent chromium equal to or exceeding 370 ppm, 519 ppm, or 52 ppm, respectively.

No excavation will take place below the water table. Current knowledge of contaminants in the soil and groundwater indicate that no excavation below the water table will be necessary. In addition, aquifer characteristics indicate that dewatering would not be feasible at this site.

- Offsite disposal of excavated soils at a Florida Class I Landfill.
- Groundwater monitoring for up to 5 years.

Statutory Determinations

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. This remedy utilizes permanent solutions and alternative treatment (or resource recovery) technology to the maximum extent practicable for this site. However, because treatment of the principal threats of the site was not found to be practical, this remedy does not satisfy the statutory preference for treatment as a principal element.

Because this remedy will not result in hazardous substances remaining onsite above health-based levels, the five-year review will not apply to this action.

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THE DECISION SUMMARY

1.0 SITE DESCRIPTION

The Standard Auto Bumper site is located in an industrialized area of northeast Dade County, Florida at 2500 West 3rd Court, approximately six miles northwest of downtown Miami and includes areas where the contamination has come to be located (Figure 1). Standard Auto Bumper is an active chromium and nickel plating facility which has operated at the same Hialeah address since 1959. The property area is approximately 42,000 square feet and geographically located at 25 degree 50'40" N latitude, 80 degree 17'15" W longitude. The site is shown in Figure 2 on the Hialeah, Florida USGS 7.5 minute topographic quadrangle map.

Standard Auto is bordered on the north by Quality Manufacturing Products, Inc. and World Metals; on the east, across West 3rd Court by Nela Junk Yard; on the south by Fernandez Transport Corporation; and on the west, across the railroad track, by the Gilda Bakery (Figure 3). The Red Road Canal is located approximately 300 feet west of the site running parallel to West 3rd Court and the railroad.

Hialeah is an incorporated city that consists of heavy development with mixed zoning. The city has an approximate population of 188,000 people and a strong manufacturing, wholesale, service and retail industry. Twenty percent of the property within a mile radius of the site is utilized for commercial and industrial purposes, sixty percent is residential, and the remaining 20 percent is used for recreational parks and schools. It is estimated that 11,000 people live or work within a mile radius of the site.

1.1 Surface Features

The ground surface at the Standard Auto Bumper site is almost entirely flat and unpaved, ranging between 6.5 feet and 9.5 feet above the National Geodetic Vertical Datum of 1929 (NGVD29). The ground surface elevation onsite is between 7.5 feet above NGVD29 on the southern part of the site and 6.8 feet above NGVD29 on the northern portion of the site. The ground surface elevation on the neighboring property to the west is between 9.0 and 9.5 feet above NGVD29 and the ground surface elevation across West 3rd Court is approximately 6.7 feet above NGVD29.

The area north of the facility building has two open excavations where removal activities of contaminated soil occurred in 1989. The open excavations are deeper on the westernmost sides and are approximately 2.5 to 3 feet in depth. The site features consist of a one story concrete block structure (approximately 19,150 square feet), two concrete holding tanks, a concrete and an asphalt slab and numerous holding and drying racks for bumpers and other chrome items. Other one story concrete block structures housing commercial/industrial businesses occupy the immediate surrounding area.

The Red Road canal is the nearest body of surface water to the site and is located to the west at a distance of approximately 300 feet. Based on the elevations obtained from the vertical control survey conducted during the RI, the Florida East Coast Railway (FEC) roadbed acts as an artificial dike that prevents any westward migration of surface water from the site.

2.0 SITE HISTORY

Standard Auto Bumper Corporation has owned the electroplating portion of the site since 1959. Prior to 1959, this property was divided into 2 facilities: located on the southern half of the site was a slaughterhouse, and on the northern half of the property was a furnace/smelting company (Yacco, 1991). In 1959 Standard Auto Bumper began chromium and nickel plating operations on the site. Prior to installation of a treatment system in 1972, the wastewater from Standard Auto Bumper's electroplating and stripping process was discharged to a drainage ditch/swale area west of the facility. Since 1972, a wastewater treatment system to convert hexavalent chromium to insoluble trivalent chromium has been operational. Approximately 5,760 gallons of wastewater per day can be processed, according to Standard Auto Bumper. Between 1972 and 1979 the effluent from the treatment system was discharged to an underground, slab-covered drainage trench located adjacent to the treatment tanks. In 1979, use of this trench was discontinued when the Hialeah sewer system became the receptor for the effluent discharge. Numerous improper discharges of treated and untreated wastes to the ground have been documented by Dade County authorities.

A Metropolitan Dade County Department of Environmental Resources Management (DERM) inspector observed effluent being discharged to a soakage trench in the back alley on May 10, 1977. The owner was ordered to correct the violations. However, on November 16, 1981, a county inspector observed that metal cleaning waste was being discharged into an on-site drain. On June 4, 1982, open and leaking drums and discharges of plating liquids were found on the ground. A pipe was also discovered leading from the facility into a ditch and the ditch water sample contained 160 mg/1 of nickel, 160 mg/1 of chromium, and 7.52 mg/1 of copper.

A county Waste Dumping Citation was also issued to the facility on June 4, 1982, and subsequent inspections found the facility had not ceased illegal discharges. A Final Notice of Violation was issued on October 5, 1983. A county inspector, on March 3, 1985, observed evidence of untreated wastewater discharges into the city sewer system.

On August 14, 1985 soil and groundwater samples collected onsite by the EPA contained numerous contaminants associated with metal plating activities. On December 3, 1985, waste samples collected by county officials contained concentrations of total cadmium and nickel which exceeded county groundwater quality standards. On September 10, 1986, county officials observed illegal discharges and an overflow pipe leading offsite.

An Expanded Site Investigation (ESI) was conducted at the Standard Auto Bumper site in March 1987, by the U.S. EPA Region IV Field Investigation Team (FIT). Numerous soil and groundwater samples were collected at the site as part of the ESI, and were used to document the Hazard Ranking System (HRS) package data and provide preliminary data for the Remedial Investigation/Feasibility Study (RI/FS).

The ESI samples were analyzed for the parameters in the Hazardous Substance List. This list, which was a precursor to the Target Compound List and Target Analyte List, included organic and inorganic chemicals. Elevated concentrations of heavy metals were found in the former disposal areas and other areas of interest. Similar contaminants were identified in the soils, groundwater, and waste effluent samples, indicating that the source of groundwater contamination is soil leachate from the discharge areas. The detected organic compounds included polynuclear aromatic hydrocarbons (PAHs) and pesticides. PAHs are associated with creosote products that can be found in railroad ties and asphalt paving. Pesticides are not related to the electroplating process and were not attributed to the Standard Auto site. No groundwater samples contained concentrations of any organic compounds above Federal or State drinking water standards. The Standard Auto Bumper site was proposed for inclusion to the National Priority List (NPL) in June, 1988 and became finalized in October, 1989, based on the HRS Package (1987).

In 1989 and 1990, Standard Auto Bumper conducted a soil removal on the property under an Administrative Order (AO) with the EPA. Under the removal action the PRP was required to excavate the soil and sludge in the bottom of the slab-covered trench. The excavated material was sent to the Chemical Waste Management facility in Emelle, Alabama for disposal. Soils were also excavated from the drainage ditch and south areas of the site to a depth of approximately 6 feet. These soils were not deemed hazardous waste and were sent to the South Dade County Landfill. The PRP's removal activities were conducted under the oversight of the EPA.

The AO for the removal specified soil clean-up levels based on the Extraction Procedure (EP) Toxicity test method for the contaminants at the site. The extraction levels included cadmium at 0.01 mg/kg, chromium at 0.05 mg/kg, copper at 0.4 mg/kg, lead at 0.05 mg/kg, nickel at 0.15 mg/kg, and cyanide at nondetectable levels.

On February 28, 1990, a second Administrative Order was signed between Standard Auto Bumper and EPA to implement the RI/FS. However, in February 1991, Standard Auto Bumper elected not to continue performing the RI/FS, and EPA, Region IV, took over the RI/FS activities. Standard Auto Bumper had not conducted any field studies at the time EPA took over the remedial activities.

The EPA conducted the preliminary RI in April, 1991. Groundwater samples were collected from existing monitoring wells at the site to determine the current conditions of the groundwater. In addition, sediment samples were collected from the Red Road Canal to provide information on the site's impact on the canal.

The first phase of the RI took place in 1991 and 1992 and consisted of the majority of the field activities (soil sampling, surface water sampling, monitoring well installation, and additional ground water sampling). Metals such as chromium, nickel, and lead were found in the samples. During Phase 2 in May 1992, two additional monitoring wells were installed and the third round of ground water samples were collected from all of the wells. Analytical data indicated that, between successive groundwater sampling events, metal concentrations in the groundwater decreased considerably. A significant portion of the apparent decrease, however, may be attributed to improved, state-of-the-art, sampling techniques that have been able to effectively eliminate turbidity.

EPA completed a Baseline Risk Assessment for the site in July 1992. The assessment evaluated the current and potential future risks posed by the contamination at the site under the no-action scenario for current and future uses of the site. The Feasibility Study (FS) Report was prepared by the EPA and finalized in August 1992. The report evaluated a range of remedial alternatives that could address the contaminated soil at the site. The alternatives included no-action, removal, and treatment.

3.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION

Prior to the RI/FS the EPA conducted an Information Availability session to introduce the Superfund process and the site to the community, explain the activities planned for the site, and answer any questions. The meeting, held on January 10, 1991 in a local school, was publicized in local papers and by door to door canvassing in the community. At the completion of the RI/FS, the RI/FS Report and Proposed Plan for the site were released to the public in August 1992. These documents were made available to the public in both the Administrative Record and an information repository maintained at the EPA Records Center in Region IV and the John F. Kennedy Memorial Library in Hialeah. The notice of availability for the documents was published in the Miami Herald on August 13, 1992, and the Spanish newspaper, Diario Las Americas, on August 7, 1992.

The Proposed Plan was sent to over 400 people in the community, government, and media. A public comment period was held from August 7 to September 6, 1992. A public meeting, announced in the public notices and in the Proposed Plan, was held in a nearby school auditorium on August 18, 1992. The purpose of the meeting was to present the proposed plan and answer questions. Three citizens attended the public meeting. A response to the comments received during this period is included in the Responsiveness Summary, which is part of this Record of Decision (Appendix A). This decision document presents the selected remedial action for operable unit one of the Standard Auto Bumper Superfund Site, chose in accordance with CERCLA, as amended by SARA. The decision for this site is based on the Administrative Record.

4.0 SCOPE AND ROLE OF OPERABLE UNIT ONE

As with many Superfund sites, studying and addressing contaminated media in the most efficient manner can be a difficult endeavor, due to complex characteristics of each site. As a result, EPA organized the site into two operable units (OUs): one to address contaminant source areas (OU #1) and the other to evaluate groundwater conditions (OU #2). The remedy presented in this ROD addresses the first operable unit, the contaminated soils at the site.

This soil poses a principal threat to human health and the environment due to ingestion of contaminated surface soils by children of potential future residents and the soil contamination's impact on the groundwater. The cleanup objectives for this OU are to prevent current or future exposure to the soil contaminated with nickel and chromium through treatment and/or containment, and to reduce the migration of these contaminants from the soil to groundwater.

The second operable unit will address the groundwater while the remedial action presented in this ROD is performed. Additional groundwater sampling will be necessary before a final decision can be made about the need for and type of cleanup alternative for this media. A decision regarding OU #2 will be presented in a subsequent ROD.

5.0 SITE CHARACTERISTICS

5.1 Surface Water Hydrology

The location of surface water in Dade County is almost completely limited to the intricate canal network that was dug to support farming, flood control and urbanization. Drainage from the site during rainfall eventsappears unlikely due to the topographic high of the limestone gravel roadbed of the Florida East Coast Railway, which acts as a barrier and the porous nature of the well drained sandy soils in the area. Surface water in the canals is in direct hydraulic connection with the Biscayne Aquifer, however, the potential for contamination from the Standard Auto site to impact the surface water in the Red Road canal by means of an overland or surface water route is remote.

The canal system was started in the early 1900's as a way to drain lands for farming along the south rim of Lake Okeechobee. Later, as a result of roads that were built across the area, water became diked and impounded and subsequent canals were built for flood control to intercept overland flow of water and divert some of the water to the southeastern coast of Florida. Because of this direct connection to the ocean, sea water intrusion became a problem. Dam-like structures or water control stations with gates to hold back or release water in the canals were built as a way to guard against flooding and sea water intrusion. During wet times of the year, the gates are opened allowing water to flow in the canals thus lowing ground water levels and preventing flooding. At the end of the rainy season and during the dry months, the gates are closed, allowing water levels to be maintained high enough in the canals to protect against sea water intrusion.

The hydraulic connection between the Biscayne Aquifer and the canal system is evident from the variation in canal elevations depending on precipitation levels. Most of the canal water level elevations are higher in the area of the site than the surrounding ground water level elevations when there is less than normal precipitation and the canal gates at water control stations are closed to prevent the movement of seawater up the canals. The reverse of this situation (i.e. canal gates open to release storm water runoff) results in lower canal water level elevations relative to the surrounding ground water level elevations.

5.2 Geology

In south Florida, the upper 3,000 feet of rocks are composed chiefly of limestone, dolomite, sand, clay, marl, and shells. Geologically, the Biscayne Aquifer is composed of soils of Holocene age and rock ranging in age from Pleistocene through Pliocene. The 1987 ESI at the Standard Auto site documented mostly unconsolidated surficial deposits consisting of calcareous sands and gravels to a depth of approximately 28 feet below land surface and quartz sands to a depth of approximately 48 feet. A harder, consolidated bedrock unit was reportedly encountered below the surficial deposits and was described as cavity-riddled, fossiliferous, marine limestone. At the site, the Biscayne Aquifer extends to a depth of approximately 110 feet below sea level.

Solution cavities occupy a significant volume of the limestone in the Biscayne Aquifer, causing it to have high horizontal and vertical permeabilities. The lower part of the oolitic limestone is also cavity riddled and is identified by the presence of bryozoans. A hard cavernous limestone underlies the bryozoan layer. Because of the extremely high permeability of this limestone, all large capacity wells are completed in this part of the aquifer, generally 40 to 100 feet below the land surface.

5.3 Hydrogeology

The uppermost hydrogeological water bearing unit in the study area is the Biscayne Aquifer. The Biscayne Aquifer is the major source of all the municipal water for the residents of the southeast coast of Florida from Boca Raton southward and is composed of limestone, sandstone, and sand.

The major aquifers in south Florida are composed primarily of limestone and supply varying yields of potable and non-potable brackish water for municipal and irrigation water use in southern Florida. The aquifers, ranging from highest to lowest yield, are: the Biscayne Aquifer of southeast Florida, the Shallow Aquifer of South West Florida, and the Coastal Aquifer of Palm Beach and Martin Counties (Figure 4). Underlying these aquifers is a thick confining layer composed of relatively impermeable beds of clay and marl which overlie the Floridan aquifer.

The Floridan Aquifer in southern Florida is composed of permeable limestone and contains non-potable brackish water. The impermeable beds separating the shallow aquifers and the deeper Floridan aquifer shield against the upward intrusion of brackish water. However, there is no shield against the lateral encroachment of seawater.

Recharge to the Biscayne Aquifer is primarily by local rainfall. Infiltration is rapid in the areas covered by sand, or where soil is absent. In the site vicinity, the soil type consists of fine quartz sand. Discharge is by evapotranspiration, canal drainage, coastal seepage, and pumping.

Transmissivity (T) of the Biscayne Aquifer ranges from 5.4 x 10[4] ft[2]/day (581 cm[2]/sec) where the aquifer is mostly sand to greater than 1.6 X 10[6] ft[2]/day (17,200 cm[2]/sec) in the limestone-rich areas. During the ESI conducted in 1987, site specific values of hydraulic conductivity (K) were determined to range between 42.8 ft/day (0.0151 cm/sec) to 102 ft/day (0.036 cm/sec) or an average of 62.6 ft/day (0.0221 cm/sec). Using the relationship T=Kb, a site specific value for the transmissivity of the unconsolidated calcareous sands and gravels and quartz sand zone can be estimated: T = 62.6 ft/day X 48 ft = 3000 ft[2]/day (32.3 cm[2]/sec). This site specific value for the transmissivity of the unconsolidated zone is an order of magnitude lower than the published value for the sandy portion of the Biscayne Aquifer.

Regional flow of ground water in the Biscayne Aquifer of southeast Florida is seaward. Locally, however, the direction and rate of

flow may be significantly influenced by the direct surface water connection of the canal system and/or by pumping from well fields.

Variations in the direction and rate of flow of groundwater was documented during the ESI and RI. During the ESI in 1987, site specific groundwater elevations indicated shallow groundwater flow towards the west. Groundwater elevations during the preliminary RI in April 1991, also indicated a westward trend in groundwater flow for shallow groundwater monitoring wells. The rate of groundwater movement at this time was an estimated 88 feet per year.

The rate of groundwater movement differed greatly in 1991, compared to previous observations. During the Phase 1 RI in January/February 1991, groundwater flow in the shallow aquifer was southeasterly and the rate of flow was approximately 1.7 feet per day. During the Phase 2 RI in May 1992, two trends were observed in the aquifer. Close to the site, shallow groundwater movement was towards the site, while farther from the site, groundwater movement was to the southwest.

5.4 Subsurface Features

In the northwest corner of the site there is an unused underground storage tank. Standard Auto Bumper had plans to remove the tank, however, no action has been taken to date. A gas line extends from the east side to the west of the site on the north edge of the property. No other underground structures are known to exist at the site.

5.5 Sampling Results

The scope of the RI at the Standard Auto Bumper site included field studies on the soils and the groundwater. Additionally, the sediment and the surface water from Red Road Canal were investigated. Soils were analyzed for thefull Target Analyte List (TAL). The investigation focused on inorganic contaminants for the following reasons. The primary reason for the reduced sample and analysis plan to include only inorganic chemicals was based on the extensive sampling efforts of the ESI. During the ESI, a variety of organic and inorganic contaminants were found in the former disposal areas and other areas of interest. Among these organic compounds were some polynuclear aromatic hydrocarbons (PAHs) and pesticides. PAHs are associated with creosote products that can be found in railroad ties and asphalt paving. Pesticides are not related to the electroplating process and are difficult to attribute to the Standard Auto site.

Another reason for the reduced analysis is that organic compounds were not detected in any groundwater samples from monitoring wells at levels above Federal or State drinking water standards during the ESI or the RI. However, trichloroethene slightly exceeded the Maximum Contaminant Level in samples from an onsite industrial well. Full TAL/TCL analyses will be conducted at the completion of cleanup to demonstrate that the site is clean.

Three areas were identified in the Remedial Investigation as having the highest concentrations of metals in soils relative to the other areas. These areas correspond to the former drainfield area north of the facility building, the loading and unloading area at the southeastern portion of the site and near the southwest corner of the site. Concentrations of chromium and nickel in these areas were one to two orders of magnitude higher than the concentrations found at most of the other soil sample locations.

5.5.1 Surface Soil

Nineteen metals and cyanide were detected in the surface soil samples. Aluminum, barium, calcium, chromium, copper, iron, lead, magnesium, manganese, mercury, nickel, strontium, titanium, and zinc were detected in nearly every surface soil sample. Surface soils were collected from the surface to a depth of 8 inches at 17 locations throughout the site.

The chromium concentrations ranged between 2300 mg/kg and 9.4 mg/kg. Table 1 presents information on the ranges of concentration of target contaminants. Concentrations of chromium in the surface soil samples were highest near the former drainfield area north of the facility building, near the southwest corner of the site property and near the loading and unloading areas at the southeastern portion of the site (Figure 5).

The three highest concentrations of nickel (4200 mg/kg, 3800 mg/kg, and 1900 mg/kg) were identified in areas corresponding to the former drainfield area north of the facility building, the loading and unloading area at the southeastern portion of the site, and near the southwest corner of the site property, respectively. The nickel concentrations ranged from 4200 mg/kg to 8.9 mg/kg.

Copper was detected at concentrations ranging from 16 mg/kg to 600 mg/kg. The highest copper detections were at the same locations as the highest chromium and nickel concentrations.

Detectable lead concentrations ranged from 7.9 mg/kg to 160 mg/kg.

5.5.2 Subsurface Soil

Nineteen metals and cyanide were detected in the subsurface soil samples from depths ranging from the 11 to 18 inch interval to the 38 to 43 inch interval. Most of the subsurface samples were obtained from 2.5 to 3 feet below the surface. The nineteen metals are: aluminum, antimony, arsenic, barium, calcium, chromium, copper, iron, lead, magnesium, manganese, mercury, nickel, silver, strontium, tin, titanium, vanadium, and zinc. A summary of subsurface soil data for the Standard Auto Bumper site is presented in Table 1. Figure 6 presents the concentrations of selected metals for each subsurface soil sample location.

The maximum concentrations of thirteen of the nineteen detected metals were found in one subsurface soil sample obtained from an area offsite, near the northwest property corner. Of both surface and subsurface soil samples, the maximum concentrations for eleven metal analytes were detected in this subsurface soil sample.

Chromium was found detected in concentrations as high as 9100 mg/kg, 1600 mg/kg, 690 mg/kg, 360 mg/kg, and 200 mg/kg. These areas correspond to the southwest corner of the site property and near the former drainfield area north of the facility building.

Relatively high concentrations (340 mg/kg, 170 mg/kg, and 140 mg/kg) of copper were identified in subsurface soil samples which are located near the southwest corner of the site property and near the loading and unloading area at the southeastern portion of the site. Elevated concentrations of nickel, 2300 mg/kg and 970 mg/kg, are found near the southwest corner of the site property. Slightly elevated nickel concentrations were found near the loading and unloading area at the southeastern portion of the site.

Aside from the maximum lead concentration found in one sample of 520 mg/kg, the lead concentration ranged from 99 mg/kg to 2.9 mg/kg.

As part of the RI/FS, the Toxicity Characteristic Leaching Procedure (TCLP) test was performed on the soil from the site. Three soil samples were collected from three locations, two surface samples and one subsurface sample. These locations were in areas containing the highest concentrations of the contaminants.

The soil did not exceed TCLP regulatory levels as shown in Table 2, indicating there are no RCRA hazardous wastes at the site. However, the TCLP results do indicate contaminants can leach, thus contributing to groundwater contamination.

5.5.3 Groundwater

Preliminary RI. During the preliminary RI in April 1991, groundwater samples were collected from seven existing monitoring wells and the industrial well. All samples were analyzed for the complete TAL and Target Compound List (TCL). A summary of significant levels of selected inorganic chemicals detected in the groundwater during this sampling event is presented in Figure 7.

The groundwater samples contained a variety of metals and some organic compounds. The most pervasive groundwater contamination was detected in the shallow groundwater monitoring well samples, particularly from the location directly downgradient from the site.

MCLs (Maximum Contaminant Levels) were exceeded for arsenic, chromium, iron, lead and manganese in most of the samples. Trichloroethene, with a MCL of 5 ug/l, was detected at an estimated concentration of 7 ug/l in the industrial well onsite. This chemical will be sampled further during OU #2 for groundwater.

Phase One. During phase one of the RI in December 1991 and January to February 1992 temporary wells were installed. Existing and newly installed shallow permanent monitoring wells were sampled and analyzed for the complete TAL. One sample was analyzed for purgeable organic compounds in addition to the TAL.

Groundwater concentrations for chromium and nickel were highest in temporary monitoring wells near the southern site property boundary. The most pervasive groundwater contamination was detected in the shallow permanent monitoring well located west and directly adjacent and downgradient from the former drainfield area north of the facility building (groundwater sampling data from temporary and permanent monitoring wells is depicted in Figures 8 and 9, respectively). The sample collected from this area contained the highest concentrations of chromium, copper, nickel, and zinc.

The samples collected from the deeper monitoring wells (Figure 9) and the onsite industrial well did not contain any detectable chromium, nickel, or copper. Overall the deeper monitoring wells and the onsite industrial well yielded samples which had low concentrations of the metals compared to the shallow monitoring wells.

The ground water samples from six shallow monitoring wells were analyzed for hexavalent chromium. Hexavalent chromium is a more toxic form of the metal than trivalent chromium. No hexavalent chromium was detected in any of the samples.

Phase one of the RI detected groundwater samples with inorganic concentrations which exceed drinking water standards.

Phase Two. Phase 2 RI field activities were conducted in May, 1992. The purpose of this groundwater sampling event was to confirm the Phase 1 results and/or identify the necessity for any additional groundwater sampling. Two deep monitoring wells were installed and sampled for the complete TAL. The 13 existing wells were also sampled and analyzed for the same parameters. The concentrations of selected inorganic analytes identified in the groundwater samples are presented in Figure 10.

Chromium, copper, lead and zinc were not detected in any groundwater samples from the shallow monitoring wells. Nickel exceeded the MCL in only one well.

The results from the newly installed monitoring wells did not appear to coincide with previous sampling results or with the current groundwater data. Chromium, lead, and nickel were detected only in the two new deep monitoring wells and not in any of the other deep wells. The concentration of these three metals were at low concentrations slightly above their detection limits. The chromium concentration was slightly above the State drinking water standard. The concentration of aluminum found in these two samples was two orders of magnitude higher than was found in any other sample. Based on these results, and the sample clarity with respect to that obtained in all other samples it appears that the samples may have been collected prior to complete development. Another sampling event will determine more representative groundwater conditions.

The results from the third round of sampling since April 1991 indicate significantly lower concentrations for most of the inorganics detected when compared to the results from the second round of sampling. The analytical results of the second and third round of groundwater sampling have indicated lower concentrations of inorganic contamination than the first round of groundwater sampling. The RI Report concluded that the particles responsible for elevated levels of metals such as chromium and nickel, found in early sampling events, had been removed as a result of additional well development conducted during the RI. The report also determined that the last sampling results are the most representative of groundwater quality and that nickel may be the only contaminant of concern at the Standard Auto Bumper site. Additional field work will be performed to confirm the condition of the groundwater during operable unit #2.

5.5.4 Surface Water and Sediment

Three sediment samples and surface water samples were collected in Red Road Canal and analyzed for TCL/TAL and TAL, respectively. The sediment samples contained metals which did not appear to be related to the site, with the exception of lead at a maximum concentration of 120 mg/kg. The surface water samples from the same location contained no detectable chromium, copper, cadmium, nickel, lead, arsenic, or cyanide.

The RI concluded that surface water data could not be correlated with the soil and groundwater data for the site. Also the upgradient surface water concentrations were nearly identical to the downgradient concentrations.

6.0 SUMMARY OF SITE RISKS

As part of the RI/FS, EPA prepared a Baseline Risk Assessment for the Standard Auto Bumper site in July 1992. This risk assessment was carried out to characterize, in the absence of remedial action (i.e., the "noaction" alternative), the current and potential threats to human health and the environment that may be posed by exposure to contaminants migrating from the soil. Results are contained in the Final Baseline Risk Assessment, dated July 21, 1992. The assessment considers environmental media and exposure pathways that could result in unacceptable levels of exposure now or in the foreseeable future. Data collected and analyzed during the RI provided the basis for the risk evaluation. The risk assessment process can be divided into four components: contaminant identification, exposure assessment, toxicity assessment, and risk characterization.

6.1 Chemicals of Concern

The risk assessment began by evaluating the soils data in the RI to identify the chemicals most likely to contribute a majority of the risk. Five contaminants in the surface soils were selected to represent the major potential health risks at the site based on concentrations at the site, toxicity, andphysical/chemical properties that affect transport and movement. Chemical data from the 16 surface soil samples (the control or background sample was not included) used to identify potential contaminants of concern (COCs) is shown on Table 3. The Baseline Risk Assessment Report determined that chromium, copper, lead, nickel and zinc were COCs at this site.

6.2 Exposure Assessment

Soil contaminant migration by way of surface water runoff is not likely at this site. The railroad spur directly west and adjacent to the site is significantly higher in elevation than the site. Infiltration through the sandy soil would be expected to be relatively rapid. Surface floods have not been observed at this site during the RI. The removal action and this remedial action reduces the likelihood of this pathway occurring.

The depth to groundwater at the Standard Auto Bumper site is typically four to six feet below ground surface. Mobile soil contaminants above the water table posed the principal threat as they can migrate to the groundwater and thus pose a risk to the Biscayne Aquifer, which is the sole source of municipal drinking water for southeast Florida.

Exposure pathways consist of four elements: 1) a source and mechanism of chemical release to the environment, 2) a retention or transport mechanism for the released chemical, 3) a point of potential human contact with the contaminated medium, and 4) a human uptake route (intake of contaminated media) at the point of exposure.

Currently, the site and the surrounding area is an industrial setting made up of numerous small businesses. The closest residents to the site are 350 feet to the west beyond the Red Road Canal. Therefore, exposure pathways could involve onsite workers for current use and residents for potential future use. Based upon the four elements above, the exposure analysis identified the following exposure pathways:

- inhalation of fugitive dust from the surface soils by onsite workers, site visitors, or hypothetical future residents

- incidental ingestion of surface soils by onsite workers, site visitors, or hypothetical future residents

- dermal contact with surface soils by onsite workers, site visitors, or hypothetical future residents

The hypothetical future resident scenario was applied to an adult resident and a child resident. Reasonable maximum exposure point concentrations of chemicals of concern in air, surface soils, and subsurface soils were estimated to quantify intakes of chemicals for each exposure pathway. General assumptions for the calculation of the intake factor regardless of pathway and specific assumptions for each exposure scenario are used to estimate intakes. These assumptions are contained in Appendix B. The Appendix also contains the exposure parameters for each receptor.

Reasonable maximum exposure point concentrations of COCs are estimated on the basis of transport and dispersion modeling and/or field measurement. These concentrations are used to estimate intakes of chemicals for each exposure pathway. For the onsite worker, the intake factor for inhalation of fugitive dust is 1.9E-1 m^3/kg-day for noncarcinogens and 6.9E-2 m^3/kgday for carcinogens; for incidental ingestion of soils is 4.9E-7 mg/kg-day for noncarcinogens and 1.7E-7 mg/kg-day for carcinogens; and for dermal contact with soils is 2.0E-8 mg/kg-day for noncarcinogens and 7.0E-9 mg/kg-day for carcinogens. Intake factors for all exposure pathway scenarios are provided in Table 4.

The site is likely to continue to be used for business or industry in the future; however, the potential for future land use to be residential does exist given the proximity of the residents.

6.3 Toxicity Assessment

To assess the possible toxicological effects from exposure, health effects criteria are derived from a review of health and environmental standards and published toxicological studies.

For risk assessment purposes, individual pollutants are separated into two categories of chemical toxicity, depending on whether they exhibit carcinogenic or noncarcinogenic effects.

Carcinogens. Slope factors (SFs) have been developed by EPA's Carcinogenic Assessment Group for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic COCs. Sfs, which are expressed in units of $(mg/kg\text{-}day)^{-1}$, are multiplied by the estimated intake of a potential carcinogen, in mg/kg-day, to provide an upper-bound estimate of the excess lifetime cancer risks associated with exposure at that intake level. The term "upper bound" reflects the conservative estimate of the risks calculated from the SF. Use of this approach makes underestimation of the actual cancer risk highly unlikely. Slope factors are derived from the results of human epidemiological studies or chronic animal bioassays to which animal-to-human extrapolation and uncertainty factors have been applied (e.g., to account for the use of animal data to predict effects on humans). Slope factors for the identified COCs are presented in Table 5.

Noncarcinogens. Reference doses (RfDs) have been developed by EPA for indicating the potential for adverse health effects from exposure to COCs exhibiting noncarcinogenic effects. RfDs, which are expressed in units of mg/kg-day, are estimates of lifetime daily exposure levels for humans including sensitive individuals and are listed for site COCs in Table 6. Estimated intakes of COCs from environmental media (e.g., the amount of a COC ingested from contaminated drinking water) can be compared to the RfD. RfDs are derived from human epidemiological studies or animal studies to which uncertainty factors have been applied (e.g., to account for the use of animal data to predict effects on humans).

6.4 Characterization of Risk

Potential noncarcinogenic and carcinogenic risks posed by the chemicals of concern in the various exposure pathways were evaluated. Noncarcinogenic effects are characterized by comparing estimated chemical intakes with chemical-specific RfDs and are expressed as the hazard quotient. Individual hazard quotients are summed for all chemicals in an exposure pathway to provide the Hazard Index (HI). HI values for the site are shown in Table 7.

The values exceeding unity indicate potential unacceptable noncarcinogenic risk. All chemicals of concern posed cumulative hazard indices below one for each exposure pathway, with the exception of the future child resident scenario. The HI for ingestion of surface soils for this child receptor is 8.5, due to the chromium and nickel in the soil.

Potential risks from lead exposure were calculated for children using the Uptake Biokinetic Model, since children are very sensitive to lead exposure. The assessment determined that the level of contamination would result in a blood-lead level below 10 ug/dL, the level of concern, if a family with a child established a residence at this site in the future.

TABLE 5

CARCINOGENIC TOXICITY VALUES FOR
CONTAMINANTS OF CONCERN
IN SURFACE SOILS

CONTAMINANT	INGESTION SLOPE FACTOR (mg/kg-day)[-1]	INHALATION SLOPE FACTOR (mg/kg-day)[-1]	DERMAL SLOPE FACTOR (mg/kgday)[-1]
Chromium	NA	4.2E+1	2.0E+2
Copper	NA	NA	NA
Lead	NA	NA	NA
Nickel	NA	8.4[*]	NA
Zinc	NA	NA	NA

* Integrated Risk Information System or Health Affects Assessment Summary Tables (HEAST), 1991.

Adjusted from an SF to an absorbed dose SF.

NA - Not Available

Source: Final Baseline Risk Assessment for the Standard Auto Bumper Site

TABLE 6

NONCARCINOGENIC TOXICITY VALUES FOR
CONTAMINANTS OF CONCERN
IN SURFACE SOILS

CONTAMINANT	INHALATION RfD (mg/kg-day)	INGESTION RfD (mg/kg-day)	ADJUSTED DERMAL RfD (mg/kgday)
Chromium	5.7.1E-7[1]	5.0E-3[1]	2.5E2[2]
Copper	NA	3.7E-2[1]	0.185[2]
Lead	NA	NA	NA
Nickel	NA	2.0E-2[1]	0.1[2]
Zinc	NA	2.0E-1[1]	1[2]

1. Integrated Risk Information System or Health Affects Assessment Summary Tables (HEAST), 1991.
2. Adjusted from an oral dose to an absorbed dose RFD.

NA - Not Available

Source: Final Baseline Risk Assessment for the Standard Auto Bumper Site

TABLE 7
HAZARD INDICES
FOR NONCARCINOGENS FOUND IN SURFACE SOIL

Fugitive Dust
Inhalation

	Hazard Indices			
Contaminant	Onsite Worker	Adult Resident	Child Resident	Visitor
Chromium	8.5E-5	0.00012	0.0006	1.9E-5
Copper	NA	NA	NA	NA
Lead	NA	NA	NA	NA
Nickel	NA	NA	NA	NA
Zinc	NA	NA	NA	NA
HAZARD INDEX:	8.5E-5	0.00012	0.0006	1.9E-5

Ingestion of Surface Soils

	Hazard Indices			
Contaminant	Onsite Worker	Adult Resident	Child Resident	Visitor
Chromium	0.12	0.4	3.8	0.064
Copper	0.0038	0.012	0.12	0.0019
Lead	NA	NA	NA	NA
Nickel	0.14	0.47	4.6	0.075
Zinc	0.00045	0.0014	0.014	0.00023
HAZARD INDEX:	0.269	0.88	8.5	0.14

Dermal Contact
With Surface Soils

	Hazard Indices			
Contaminant	Onsite Worker	Adult Resident	Child Resident	Visitor
Chromium	1.2E-3	0.0044	0.0019	0.00068
Copper	3.7E-5	0.00014	0.00059	2.0E-5
Lead	NA	NA	NA	NA
Nickel	1.4E-3	0.0053	0.023	0.0008
Zinc	4.4E-6	1.6E-5	7.15E-5	2.4E-6
HAZARD INDEX:	0.0026	0.0026	0.043	0.0015
HAZARD INDEX: ACROSS ALL PATHWAYS	0.27	0.88	8.5	0.14

NA - Not Available
Source: Final Baseline Risk Assessment, July 21, 1992

Carcinogenic risks are estimated as the incremental probability of a person developing cancer over a lifetime as a result of exposure to a potential carcinogen. The chemical intake level is multiplied by the cancer potency factor. An excess lifetime cancer risk of 1E-6 indicates that an individual has a one in one million additional chance of developing cancer over a 70-year lifetime as a result of site-related exposure to a carcinogen under the specific exposure conditions at a site.

The NCP states that sites should be remediated to chemical concentrations that correspond to an upper-bound lifetime cancer risk to an individual not exceeding 10[-6] to 10[-4] excess lifetime risk. Carcinogenic risk levels that exceed this range indicate the need for performing remedial action at a site. The carcinogenic risk levels are shown in Table 8. No carcinogenic risks levels exceeded 10E-6, except for the child resident scenario. The carcinogenic risk level from surface soils for the child receptor is 2.5E-5, due to the risk from chromium and nickel inhalation. The estimate of carcinogenic risk is conservative and may overestimate the actual risk due to exposure.

In summary, an unacceptable noncarcinogenic and carcinogenic risk is present, primarily from chromium and nickel at this site. Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

6.5 Environmental Risks

The ecological effects due to releases from contaminated soils are not expected to be significant for a variety of reasons. First, this site does not provide habitat resources for wildlife, due to the industrial nature of the site. Second, the site and canal data and the nature of the relationship of the canal to the site do not indicate there is an offsite environmental risk. The sampling data for surface water from the nearby Red Road Canal indicates no relation to site contamination. Also, canal sediments indicate minor levels of contamination that cannot be linked to the site, due to the high amount of traffic and industrial activity between the site and canal. DERM has been made aware of the findings. It is likely that the lead and zinc could be a result of traffic or industrial influences and not the site. Contamination via surface water discharge is not likely due to the businesses, elevated railroad, and four-lane road located between the site and the canal.

7.0 REMEDIATION GOALS

Risk Assessment remediation goals were developed for chromium and nickel based upon the exceedance of acceptable EPA standards (1 for hazard index and 10[-6] for risk level) for the child receptor for the COCs. The remediation goal was developed to provide a level that would result in a risk level of less than 10[-6] and a hazard index of less than 1.0. Under these conditions, the remediation goal of total chromium is 519 mg/kg, hexavalent chromium is 52 mg/kg, and nickel is 1600 mg/kg.

TABLE 8
CARCINOGENIC RISK LEVELS
FOR SURFACE SOILS

Pathway	Onsite Worker	Adult Resident	Child Resident	Visitor
	Risk Level			
Fugitive Dust Inhalation				
Chromium	7.6E-10	1.2E-9	2.3E-5	6.7E-11
Nickel	7.6E-11	1.2E-10	2.3E-6	6.5E-12
Ingestion of Surface Soils (Lead)	NA	NA	NA	NA
Dermal Contact with Surface Soils (Lead)	NA	NA	NA	NA
TOTAL RISK FROM SURFACE SOIL:	8.4E-10	1.3E-9	2.5E-5	7.4E-11

NA - Not Available

Source: Baseline Risk Assessment, July 21, 1992

The EPA determined that nickel and chromium soil remediation goals (maximum soil concentrations of nickel and chromium) are necessary to also protect groundwater. These remediation goals are designed to insure that leachate from the soil will not cause concentrations of these metals in groundwater to exceed the MCLs. This is important because the Biscayne Aquifer is located beneath the site and is the sole source of municipal drinking water for southeast Florida.

Three groundwater models were used to determine these soil remediation goals. The fate and transport model, MULTIMED, was used to calculate the levels of contribution to groundwater that would be caused by given soil levels of nickel and chromium. The geochemical, metals speciation model, MINTEQA2, was used to determine the relative mobilities of nickel, chromium, and other possible contaminants at the site. And, finally, the results of MULTIMED were cross-checked with a leaching-flow continuity model, the SUMMERS MODEL, to arrive at the final soil cleanup level for nickel.

Nickel

A soil/water distribution coefficient (Kd) for nickel of 35 milligrams of nickel/kilogram of soil per milligram of nickel/liter of water (or 35 l/kg) was determined for the site by EPA's Environmental Research Laboratory. This Kd is fairly low, indicating that divalent nickel (the common species of nickel in surface and groundwater) is considerably more soluble and mobile than many other metals, such as lead or trivalent chromium. Using this Kd, the soil cleanup level calculated for nickel was 370 mg/kg. This cleanup level should insure that nickel leaching from the soil will not result in a groundwater concentration exceeding the nickel MCL of 0.100 mg/l (100 ug/l). This level of 370 mg/kg, for the protection of groundwater, is considerably more stringent than the protective level for direct exposure to soil calculated in the risk assessment (1600 mg/kg).

Chromium

Chromium can exist in one or both of two oxidation states under normal environmental conditions: trivalent chromium [Cr (III)] and hexavalent chromium [Cr(VI)]. Chromium can be converted between the two oxidation states, but typically it does not. For Cr(III) to be oxidized to Cr(VI), a catalyst and an oxidizing agent (such as manganese dioxide), must usually be present under very acid conditions. The mobilities of the two species of chromium are also quite different. Cr(VI) is extremely mobile, even more so than nickel; but Cr(III) is virtually immobile. Cr(III) is very insoluble and adsorbs strongly to soil particles.

EPA analysis for Cr(VI) in the groundwater indicated none present, with a minimum detection level of 10 ug/l. Back-calculating this levelthrough the MULTIMED model showed 10 ug/l in the groundwater would be equivalent to only 0.05 mg/kg of Cr(VI) in the soil. This indicates that virtually all chromium present must be Cr(III) and that particulate transport of Cr(III) on colloidal material is the most likely mechanism through which Cr is found in the groundwater. While this mechanism cannot be modeled at present, a reasonable assumption is that adsorption of these colloidal particles onto the aquifer matrix would decrease the measurable amount of total Cr in the groundwater over time.

Because of the uncertainties of modeling the fate and colloidal transport of Cr(III), a toxicological approach was used. This approach considers the uncertainty of both the oxidation states of chromium and toxicological effects of both Cr(VI) and Cr(III). This approach resulted in a soil cleanup recommendation for total chromium of 519 mg/kg and hexavalent chromium of 52 mg/kg, based on an inhalation risk, which will also insure that any leachate from the site will not cause the State drinking water standard (0.1 mg/l) or MCL (0.1 mg/l) for chromium to be exceeded.

Other Remediation Considerations

High soil concentrations of nickel and chromium are typically found at the site in areas which also contain the highest concentrations of other metals, such as copper, lead, and zinc. These metals would be removed as nickel and chromium is removed, therefore reducing the overall cumulative risk below protective levels for both soil and groundwater. In cleaning up soils above the water table at the site which contain nickel above 370 mg/kg, total chromium above 519 mg/kg, and hexavalent chromium above 52 mg/kg these protective levels would be attained.

These soil cleanup goals are expected to insure that drinking water standards would not be exceeded in the downgradient groundwater. This expectation, subject to verification by groundwater monitoring, would minimize the measures necessary for groundwater remediation which will be addressed in OU #2. These cleanup goals will also reduce the risks associated with direct health threats to a child, considering the future child resident scenario, to protective levels.

Based on analytical data collected during the RI and presented in the RI Report, a total of 2500 cy of soil are estimated to contain contaminants above the soil remedial goals of 370 mg/kg nickel, 519 mg/kg total chromium, and 52 mg/kg hexavalent chromium.

8.0 DESCRIPTION OF ALTERNATIVES

A feasibility study was conducted to develop and evaluate remedial alternatives for contaminated soils at the Standard Auto Bumper site. Remedial alternatives were assembled from applicable remedial technology process options and were initially evaluated for effectiveness, implementability, and cost. The alternatives meeting these criteria were then evaluated and compared to nine criteria required by the NCP. The NCP also requires that a noaction alternative be considered at every site to serve primarily as a point of comparison for other alternatives.

8.1 Alternative 1 - No Action

Capital Cost: 0
Present Worth (PW) Operation & Maintenance (O&M) Cost: $94,700
Total PW: $94,700
Months to Implement: None

This alternative does not provide any remedial activities to address the source of contamination. Contaminants in the soil would continue to leach into the groundwater. Monitoring for at least 30 years would be included to evaluate trends in the contaminants' concentrations in the groundwater due to the continued migration of contaminants in the soil. Existing monitoring wells would be used for long-term groundwater monitoring.

Because this alternative would result in contaminants remaining onsite, CERCLA requires that the site be reviewed every five years. If indicated by the review, remedial actions would be implemented at that time to remove or treat the contaminated soil.

The No Action alternative was considered as a baseline option for comparison to other remedial action alternatives.

8.2 Alternative 2 - Excavation and Offsite Disposal

Capital Cost: $298,000	Total PW: $338,186
PW O&M: $40,186	Months to Implement: Two

This alternative would consist of excavating the contaminated soil and loading it onto trucks and hauling it to a Florida Class I solid waste landfill. After excavation, clean backfill material would be placed and the area would be regraded.

The landfill requires all soils to be nonhazardous waste as defined by 40 CFR 261. Because it has been confirmed during the RI/FS that the soil at the site is neither characteristic or listed hazardous waste, DERM has approved the disposal of the contaminated soil at the county or other local landfill. Wastes are considered to be RCRA characteristic if they exhibit Toxicity Characteristics (TC).

The TC rule specifies chemicals which, if present in waste at or above regulatory levels set in the rule, make the waste a hazardous waste. The contaminants at Standard Auto Bumper were below the regulatory levels.

The contaminated soil would be excavated to either the cleanup level or the point when the water table is encountered. Dewatering would be very difficult at this site, due to the high transmissivity of the aquifer. Groundwater is estimated to be at a depth of 4 to 8 feet. Confirmation samples would then be collected at the base of any excavation not into the groundwater. If the results indicated that contaminants are still above cleanup levels (370 mg/kg nickel, 52 mg/kg hexavalent chromium, and 519 mg/kg total chromium), then additional soil would be removed until the cleanup level is met or groundwater is reached. If all cleanup goals were attained the area would be backfilled with clean soil. For optimal performance of this remedial action alternative, the soils would be excavated during dry periods of the year. As determined in the previous section, the site contains separate blocks of areas to be excavated. At a minimum, excavation would occur in the areas indicated on Figure 11. The total volume to be excavated would be approximately 2500 cubic yards.

The excavated soil would be placed in containers or trucks by standard dirt-lifting equipment, such as a backhoe, and transported to the landfill. DERM would be notified that the soil would be taken to the landfill. Transportation routes to the landfill would be established for safe transport.

Periodic groundwater monitoring would determine the effectiveness of the alternative at reducing migration of inorganic compounds to the groundwater. Existing wells would be sampled periodically for up to 5 years.

8.3 Alternative 3 - Excavation, Onsite Soil Washing, and Onsite Replacement

Capital Cost: $878,000	Total PW: $891,650
PW O&M: $13,650	Months to Implement: Seven

Alternative 3 consists of excavating the contaminated soils, washing the soil with the washwater and/or solvent, placement of clean soil back into the excavated area, washwater treatment, and sludge disposal. The replaced soil would be covered with clean soil and graded. Excavation would follow the procedure outlined in Alternative 2 above.

As shown in Figure 12, the soil washing process would consist of a temporary soil mixing/scrubbing unit to uniformly distribute the solvent washwater in the soil. As the 2500 cy of excavated soil is placed in the unit in batches, the washwater and solvent is mixed thoroughly with the contaminated soil. Rinse water is then applied to the soil to remove any residuals. Any remaining washing agent within the soils would be removed with a non-hazardous solvent. The clean rinsed soil would be sampled to verify all contaminants meet the cleanup goals. If all cleanup goals are met, the soil would be replaced on site and the excavation area backfilled and regraded as needed. If cleanup goals are not met, then the soil would be washed again.

The collected washwater containing the contaminated soil particles would undergo dewatering treatment onsite, such as gravity separation, flocculation, or vacuum filtration. The concentrated fines from the dewatering are estimated to be 10% of the original mass of the treated soil. These fines would be treated through solidification or disposed in a RCRA hazardous waste landfill, depending on the quantity and concentration of the contaminants.

The fines would be tested prior to offsite disposal. These fines would probably be characterized as RCRA characteristic wastes for lead, chromium, cadmium, or arsenic because the contaminants are concentrated into the smaller volume of soil.

The TCLP would be performed on the concentrated fines from the soil washing process prior to disposal. If the fines exceed any of the leachate regulatory levels, the fines would be handled as hazardous waste. For offsite disposal the fines would be manifested by a licensed hazardous waste hauler and transported to an approved RCRA Subtitle C hazardous waste landfill. For onsite disposal, the fines would be treated to comply with the TCLP regulatory levels. The rinse water may be treated before it would be recycled to the soil washing process.

Screening level treatability tests performed during the RI indicated soil from the site was not amenable to use of hydrochloric acid as an extracting agent, indicating another treatability test would be necessary prior to actual application of this alternative.

8.4 Alternative 4 - Excavation, Stabilization/Solidification and Onsite Disposal

Capital Cost: $232,000 Total PW: $385,225
PW O&M: $153,225 Months to Implement: Three

This alternative consists of excavating the contaminated soils, chemical stabilization/solidification of the soils and placement onsite. A treatment diagram is provided on Figure 13. Excavation would follow the same procedure as described in the above alternative. The 2500 cy of excavated soil would then be placed on a temporary storage pad or directly into the fixation units.

Soil would be processed in the fixation units onsite with one or more fixation/solidification agents such as silicate and portland cement or fly ash to ensure the new material remains non-hazardous, with respect to the contaminant leachability, and to ensure the contaminants do not contribute to groundwater degradation. Inside the process unit as the soil enters the mixer approximately 10% water is added along with the cement dry agent. The operation is similar to cement mixing and when the mixture is at a wet concrete-like consistency, a liquid reagent can be added, which enhances chemical encapsulation of the metals.

This solidified mass can be transferred from the mixer using a pump to the desired placement location. The mass would be tested for compressive strength. Unconfined compressive strength at the design cure period would be at least 50 psi. Permeability would be required to be less than 10[-5] for land burial. The treated soil would be replaced in excavation areas and is expected to undergo a 15-25% increase in volume. The specific placement would be determined and evaluated during the remedial design and would consider the depth of the water table. The fixation process units would be set up on site. Samples would be required from the treated soil to assure compliance with longterm leachability criteria. The solidified monolith would be covered with soil and vegetated. Deed restrictions would be implemented to ensure the integrity of the solidified material.

For placement of treated soil below the surface, long-term O&M would include monitoring wells surrounding the monolith. Groundwater monitoring would determine the effectiveness of the alternative at reducing migration of inorganic compounds to the groundwater. Existing wells or new wells would be sampled periodically for a minimum of 30 years after the construction is completed.

Onsite maintenance would also be required and would include checking the monolith area for erosion. The screening level treatability test performed during the RI indicated stabilization/solidification was effective in reducing TCLP levels in nickel and copper. Lead was not affected and chromium TCLP levels increased but were still below TCLP regulatory levels. Another treatability test would be necessary prior to implementation of this alternative to determine optimal stabilizing agents. However, this is a proven treatment for metal-contaminated wastes.

9.0 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

The remedial alternatives developed in the FS for contaminated soil were analyzed in detail using nine evaluation criteria. The resulting strengths and weaknesses of the alternatives were then weighed to identify the alternative providing the best balance among the nine criteria. These criteria are 1) overall protection of human health and the environment; 2) compliance with applicable or relevant and appropriate requirements (ARARs); 3) reduction of toxicity, mobility, or volume through treatment; 4) long-term effectiveness and permanence; 5) short-term effectiveness; 6) implementability; 7) cost; 8) state acceptance; and 9) community acceptance. The first two criteria are essential and must be met before an alternative is considered further. The next five criteria are used to further evaluate all options that meet the first two criteria. The final two criteria are used to further evaluate the proposed plan after the public comment period has ended and comments from the community and the State have been received. This evaluation of each of the alternatives against the nine criteria is summarized below.

Overall Protectiveness. All of the alternatives except the no action alternative are protective of human health and the environment and comply with the ARARs identified for the site or obtain an equivalent level of performance. Therefore, Alternative 1, no action, is not acceptable and will not be considered further. Risk of exposure from further migration of the contaminants through the soil to the groundwater is reduced in

Alternatives 3 and 4 by treating the contaminated soil to the cleanup levels and in Alternative 2 by removing the contaminated soil to the cleanup levels. Alternatives 2, 3, and 4 all provide protection from contaminant migration from the soil to the groundwater. In addition, risk associated with the child resident scenario is minimized by these alternatives.

Compliance with ARARs. All alternatives would comply with the Federal and State action-specific ARARs. Applicable action-specific requirements would be the Resource Conservation and Recovery Act (RCRA) regulations (forhazardous wastes as defined by 40 C.F.R. 261). Because there are no RCRA listed or characteristic wastes at the site, this requirement would not apply to the soils. However, this requirement may apply to the treatment residuals from the site, depending on whether they are listed or characteristic wastes. Any hazardous waste would either be treated to levels below the TCLP regulatory levels or be taken to a RCRA Subtitle C hazardous waste landfill.

Contaminated media that is not listed or characteristic waste would need to be disposed in a Florida Class I landfill, therefore the FDER Class I and RCRA Subtitle D landfill regulations would be applicable.

Other action-specific requirements that would be appropriate are Department of Transportation Hazardous Materials Transportation rules for offsite transport, and National Air Quality Standards for excavation. State action-specific requirements that would apply are the Florida Ambient Air Quality Standards and the Florida Air Pollution Rules.

No chemical-specific ARARs are available for soil and there are no location-specific ARARs.

No waiver from ARARs is necessary to implement any alternatives.

Long-Term Effectiveness and Permanence. Alternative 2 would remove all waste to a permitted offsite landfill, thereby eliminating any long-term risks of exposure at the site. This alternative also offers a high degree of certainty that it will be executed successfully and is considered to be an irreversible permanent remedy. Alternative 3 employs an irreversible treatment process to provide long-term effectiveness and permanence to reduce hazards posed by all known wastes at the site. Alternative 4 utilizes treatment to achieve slightly less long-term effectiveness. The stabilization/solidification process does have a low potential to leach contaminants in the future and therefore may not be as permanent as the other two alternatives. However, this technology has been demonstrated to be effective at similar sites and long-termmonitoring of the groundwater would detect any breakdown of the treatment remedy. Alternative 4 would rely on institutional controls to ensure future integrity of the solidified material, by requiring deed restrictions.

Reduction of Toxicity, Mobility, or Volume. Alternative 2 would reduce the toxicity, mobility, and volume of contaminants at the site. This alternative would not utilize treatment; however, the estimated 2500 cy of waste would be transported to a permitted landfill offsite where mobility would be reduced by containing the contaminated soil in a secure landfill. However, toxicity and volume would not be reduced. Alternatives 3 and 4 use treatment or fixation technologies to reduce the inherent hazards posed by the soil contaminants at the site. These two alternatives would satisfy the statutory preference for treatment as a principal element, to the maximum extent practicable.

The stabilization/solidification process in Alternative 4 encapsulates the soil contaminated with heavy metals, reducing the mobility of the metals. There is a small potential for the fixation process not to maintain the contaminants in the chemical bond in the long-term, thereby initiating risk of contaminants migrating to the groundwater. Treatability tests would minimize this possibility. The stabilization/solidification process in Alternative 4 increases the soil volume by the addition of cementing materials and/or additives. The increase in volume is estimated to be fifteen to twenty-five percent of the original waste material.

Soil washing in Alternative 3 uses chemical interactions to reduce the toxicity, mobility or volume of the soil contaminants to levels which are protective of groundwater. However, this technology has not demonstrated full capability of attaining the cleanup goals. Alternative 3 would require additional management of residuals.

The treatment process for this alternative would reduce the volume of contaminated soil by washing the contaminants from the soil into a concentrated waste stream. This smaller volume of waste contains the finer soil particles, contaminants and some washwater. The washwater would require treatment and the concentrated contaminated fine soil would require treatment or offsite RCRA hazardous waste disposal. The soil washing process in Alternative 3 would render approximately 90% of the soil uncontaminated.

Short-term effectiveness. Alternative 2, 3, and 4 are expected to be protective of human health and the environment throughout construction and implementation. Similar risk exists for all alternatives to workers, the community and the environment during excavation and treatment or removal. Alternatives 2, 3, and 4 would involve implementing dust control measures during excavation of the soils to prevent release of increased particulates into the atmosphere.

Alternatives 2 and 4 would provide protectiveness in a relatively short time, compared to Alternative 3. A construction period of only one month for Alternative 2 and two to three months for Alternative 4 would be required to achieve short-term protection. Alternative 2 poses a risk during transportation of the contaminated soil to the offsite facility and Alternatives 3 and 4 pose a risk during the treatment process. Careful implementation of standard safety protocols would lessen this risk.

Alternative 3 is anticipated to have the least short-term effectiveness. Alternative 3 would require the longest implementation time of five to seven months. This alternative poses a risk of accidental exposure to the soil washing additive. Also, there is a risk the cleanup goals may not easily be met during the soil washing, which would require additional washes and additives. This would slow the process. Alternative 3 requires treatability tests to determine effectiveness and optimal design, prior to starting.
Implementation. Alternative 2 would not require specialized materials, and equipment beyond common excavation equipment. Alternative 2 is a proven technique and would not require treatability studies. Prior to disposing offsite, this alternative would require coordination with the landfill. Alternatives 2 and 3 would require less future O&M than Alternative 4 since the contamination is removed from the site or the soils, respectively.

Alternatives 3 and 4 would both require specialized equipment, materials, and labor, which is available from a variety of vendors. There are more vendors available for stabilization/solidification in Alternative 4 that have demonstrated effectiveness than for soil washing in Alternative 3. The solidification process of Alternative 4 can be conducted onsite in a suitable area which is large enough for portions of the soil to be processed and allow for workers to operate the equipment. Alternative 3 would require more elaborate process equipment than Alternative 4, which would drive up the cost. Treatability tests would be required for Alternatives 3 and 4 to ensure that the soil washing would remove the contaminants to concentrations below the cleanup goals, and to ensure the mixtures of fixation agents would prevent the contaminants from leaching into the groundwater, respectively. However, the nature of the contaminants and the characteristics of the soil have been shown to be more responsive to the treatment process in Alternative 4 than Alternative 3.

Soil washing (Alternative 3) has been selected as the remedial alternative at other Superfund sites; however, the cleanup goals for these sites were higher than those for this site. Also, soil washing was not shown to be as effective as stabilization/solidification for the contaminants at the site in small scale treatability tests and soil washing requires a larger area for the process operation than the fixation alternative.

Cost. Alternative 2 is the most economical alternative with a total present worth cost of $338,186. This alternative offers similar protectiveness compared to the other alternatives and is a proven technique. Alternative 4 has a total present worth cost of $385,225. The higher cost of Alternative 4 is primarily due to the O&M, which accounts for 40% of the total cost.

The soil washing process drives the high capital cost of $878,000 for Alternative 3 and the low O&M cost of $13,650 does not totally replace the loss of money to capital outlay. This alternative's total present worth cost of $891,650 is the least economical without providing additional protectiveness.

It is assumed for all alternatives that construction would begin within one year.

State Acceptance. The State of Florida, as represented by the Florida Department of Environmental Regulation

(FDER), has been the support agency during the Remedial Investigation and Feasibility Study process for the Standard Auto Bumper site. In accordance with 40 CFR 300.430, as the support agency FDER has provided input during this process. Based upon comments received from FDER, it is expected that concurrence will be forthcoming; however, a formal letter of concurrence has not yet been received.

Community Acceptance. The local Dade County Department of Environmental Resources (DERM) has been involved with this site. EPA has consulted DERM on the site and the alternatives. DERM and EPA will continue to work together to provide the best remedial action which minimizes the potential for impacts to the nearby businesses and residents to the site. DERM has provided assurance that the soil may be sent to a Florida Class I Landfill.

During the 30-day public comment period, no comments were received from the community. The public meeting at which EPA presented the proposed plan was attended by three people. Overall, there has been very little community interest at this site throughout the Superfund process, even though over 400 proposed plans were sent to the community, media, and government officials and newspaper articles have highlighted this site. There is no indication the public would not support the selected remedy.

10.0 SELECTED REMEDY

Based upon consideration of the requirements of CERCLA, the NCP, the detailed analysis of alternatives and public and state comments, EPA has selected a source control remedy for this site. At the completion of this remedy, the risk associated with this site has been calculated at less than 10^{-6} for carcinogens and less than one for noncarcinogens, which is determined to be protective of human health and will be protective of the environment. The total present worth cost of the selected remedy, Alternative 2, is estimated at $338,186.

A. SOURCE CONTROL

Source control remediation will address the contaminated soils at the site. Source control shall include excavation of contaminated soils, transportation to a Florida Class I landfill, backfilling the excavated area and site monitoring.

A.1. The major components of the source control to be implemented include:

- Complete excavation from the surface soils of soil contaminated with total chromium, hexavalent chromium, or nickel above 519 mg/kg, 52 mg/kg, and 370 mg/kg, respectively, or interface with the water table (approximately 2500 cubic yards).
- Offsite disposal of the excavated soil at a Florida Class I landfill,
- Backfilling the excavated areas with clean fill, and
- Groundwater monitoring for the contaminants of concern for up to 5 years.

A.2. Performance Standards.

The performance standards for this component of the selected remedy include, but are not limited to, the following excavation and disposal standards:

a. Excavation Standards

Excavation shall continue until the remaining soil achieves the maximum levels below or until the water table is reached. All excavation shall comply with ARARs, including but not limited to the Clean Air Act, Florida Air Pollution Rules, Florida Ambient Air Quality Standards, Subtitle D requirements, and DOT requirements. All work at the site shall comply with OSHA requirements. Testing methods approved by EPA or that are the best available technology shall be used to determine if the maximum nickel and chromium concentration levels shown below have been achieved in the remaining soil.

Total Chromium	519 mg/kg
Hexavalent Chromium	52 mg/kg
Nickel	370 mg/kg

The soil cleanup levels are necessary to ensure that migration of all the contaminants into the groundwater is minimized and were developed during the Risk Assessment based on risk to human health and the environment (the groundwater). Cleanup to these standards will ensure that contaminants do not continue to migrate into the groundwater and human health risks are reduced to protective levels.

b. Disposal Standards

Transportation of the contaminated soil will be conducted in accordance with DOT regulations. The excavated soil shall be transported from the site to the Class I landfill (liner and leachate collection) using approved transportation routes for safe transport. All soil to be disposed of offsite must meet the following criteria:

- Non-hazardous waste as defined by the TCLP test (40 CFR 261)

The landfill must meet FDER Class I landfill regulations.

B. COMPLIANCE TESTING

Groundwater monitoring shall be conducted at this site. After demonstration of compliance with Performance Standards, the site groundwater shall be monitored for the contaminants of concern for up to five years to verify that the removal of the contaminated soil in excess of those levels set forth in paragraph A.2 does minimize the impact these contaminants have on the quality of the underlying aquifer. If monitoring data indicates the soils continue to be a source of groundwater contamination after implementation of the remedial action, EPA will re-evaluate the effectiveness of the remedy.

Because this remedy will not result in hazardous substances remaining onsite above health-based levels, the five-year review will not be necessary at this site.

11.0 STATUTORY DETERMINATIONS

EPA's primary responsibility at Superfund Sites is to select remedial actions that are protective of human health and the environment. CERCLA also requires that the selected remedial action for the site comply with applicable or relevant and appropriate environmental standards established under Federal and State environmental laws, unless a waiver is granted. The selected remedy must also be cost-effective and utilize permanent treatment technologies or resource recovery technologies to the maximum extent practicable. The statute also contains a preference for remedies that include treatment as a principal element. The following sections discuss how the selected remedy for contaminated soils at the Standard Auto Bumper site meets these statutory requirements.

Protection of Human Health and Environment

The selected remedy protects human health and the environment by reducing levels of contaminants in the source of contamination, the soils, through excavation and containment. Eliminating the source of contamination will reduce levels of contaminants migrating from the soils into the groundwater, and reduce the threat to levels below 10^{-6} for carcinogens and a Hazard Index of below one for noncarcinogens for future child residents ingesting contaminated soil. No unacceptable short-term risks or cross-media impacts will be caused by implementation of the remedy.

Compliance with ARARs

All ARARs will be met by the selected remedy.

Chemical-Specific ARARs. No chemical-specific ARARs apply to contaminated soils.

Action-Specific ARARs. Federal action-specific ARARs include the National Ambient Air Quality Standards under the Clean Air Act. State action-specific ARARs include the Florida Air Pollution Rules FAC 17-2.1 and Florida Ambient Air Quality Standards FAC 17-2.3.

RCRA Land disposal restrictions (LDRs) are not applicable or relevant and appropriate. The contaminated soil at the site is not a listed or characteristic RCRA waste. In studies conducted for the FS, the soil did not exceed the regulatory TCLP criteria for chromium and lead (no regulatory level has been established for nickel).

Nickel, chromium, and lead are listed CERCLA hazardous substances as defined by CERCLA 40 CFR 302.4. However, because the soil is a RCRA nonhazardous waste it may be disposed in a permitted solid waste landfill. Therefore the RCRA Subtitle D requirements and FDER Class I requirements will apply to the landfill and DERM requirements for soil disposal in a local landfill will also apply.

DOT requirements will be appropriate to consider during transport of the contaminated soil to the landfill.

Location-Specific ARARs. No location specific ARARs are applicable or relevant and appropriate for the site.

Cost-Effectiveness

After evaluating all of the alternatives which satisfy the two threshold criteria above, EPA has concluded the selected remedy affords the highest level of overall effectiveness proportional to its cost. Section 300.430(f)(1)(ii)(D) of the NCP also requires EPA to evaluate three out of the five balancing criteria: long-term effectiveness and permanence; reduction of toxicity, mobility or volume through treatment; and short-term effectiveness, to determine overall effectiveness. Cost-effectiveness is determined by evaluating these balancing criteria to determine overall effectiveness. Overall effectiveness is then compared to cost to ensure that the remedy is cost-effective. The selected remedy provides for overall effectiveness in proportion to its cost.

The estimated total present worth cost for the selected remedy is $338,186.

Utilization of Permanent Solutions and Alternative Treatment Technologies or Resource Recovery Technologies to the Maximum Extent Practicable ("MEP")

EPA believes the selected remedy represents the maximum extent to which permanent solutions can be utilized in a cost-effective manner for the Standard Auto Bumper site. After evaluating the alternatives that are protective of human health and the environment and comply with ARARs, EPA has determined that the selected remedy provides the best balance in terms of the remaining criteria.

The selected remedy includes offsite disposal of untreated contaminated soil which does not satisfy the preference for treatment as a principal element. EPA has determined however that the benefits of this alternative, asdetermined by the balancing and modifying criteria, outweigh the disadvantage of not employing treatment. Treatment was found to be unnecessary for the waste at this site, due to the non-hazardous nature of the contaminated soil, as defined by RCRA. However, a cleanup action is necessary to reduce the risk to human health and the environment to acceptable levels. In making the determination for or against offsite disposal, the modifying criteria of state acceptance was considered (Section 300.430(f)(1)(ii)(E) of the NCP. In light of this consideration, EPA decided after evaluating all nine criteria to select excavation and offsite disposal for this site.

This selected remedy provides protectiveness; attains ARARs; offers long-term effectiveness and permanence; and reduces toxicity, mobility, or volume of contaminants at the site. Excavation and offsite disposal requires the simplest equipment, the shortest implementation time, and is the most cost effective of all the alternatives.

This remedy is consistent with future response actions that may be considered for the site by addressing the source of contamination at the site. Source control reduces or eliminates the level of further action at the site that would be necessary for OU #2, groundwater.

Preference for Treatment as a Principal Element

The statutory preference for treatment is not satisfied by the selected remedy; however, excavation and offsite disposal utilizes a cost-effective method to address the threats posed by conditions at the site. The cleanup objectives of the selected remedy address the health and environmental threats at the site: direct contact with contaminated surface soil and migration of soil contaminants to the groundwater. The remedy will reduce the toxicity, mobility, and volume of the contaminants at the site and will provide long-term effectiveness and permanence.

12.0 DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan was released for public comment during August and September 1992. Three changes to the Proposed Plan have been made since its release and will be described in this section.

The Proposed Plan identified Alternative 4, excavation of contaminated soil, onsite stabilization/solidification, and groundwater monitoring, as the preferred alternative. One of the other alternatives (Alternative 2) presented in the Proposed Plan and in the FS involved excavation of contaminated soils and offsite disposal. The original preference for Alternative 4 was based in part on the preference for employing an onsite treatment alternative at a site. However, during the public comment period, staff at FDER voiced a preference for Alternative 2 because this alternative did not require the longterm O&M that Alternative 4 required. Groundwater monitoring for up to 30 years was necessary to ensure the integrity of the stabilization/solidification treatment in Alternative 4. Upon re-evaluation of the two alternatives, the offsite disposal remedy was determined to be a more reliable, long-term effective, permanent, implementable, and cost-effective remedy for the estimated quantity of contaminated soil at the Standard Auto Bumper site than the stabilization/solidification remedy originally preferred.

The Proposed Plan did not state that institutional controls would be required for Alternative 4 to ensure the integrity of the solidified material. EPA decided that deed restrictions would provide more effective longterm protectiveness for this alternative and has included it in the description of Alternative 4.

Lastly, the Proposed Plan stated a cleanup goal for nickel only. EPA and FDER decided that a cleanup goal was also necessary for chromium to ensure this contaminant was reduced to protective levels during the implementation of the remedy.

APPENDIX A

RESPONSIVENESS SUMMARY

This summary presents all of the Agency's responses to comments received from the community, local officials, and potentially responsible parties (PRPs) for the Standard Auto Bumper site operable unit one, soils.

A. OVERVIEW

At the start of the public comment period, EPA released its selection for the preferred alternative via the media and the proposed plan. EPA's recommended alternative was excavation of contaminated soil, onsite stabilization/solidification, and groundwater monitoring. Based on the comments received from the State of Florida and documented herein, EPA reevaluated the alternatives and selected another alternative. The alternative specified in this Record of Decision involves excavation of contaminated soil and offsite disposal.

Judging from the comments received from the residents in the community during the public comment period, the community would not be adverse to excavation and offsite disposal. The local citizens did not voice objections to any of the alternatives.

B. BACKGROUND ON COMMUNITY INVOLVEMENT

Community interest in the Standard Auto Bumper site has been very limited dating back to the start of the Remedial Investigation when EPA held a public availability session at the Henry M. Filer Middle/Community School. The meeting, held on January 10, 1991, was announced in the local newspaper and an EPA fact sheet. The only person from the community who attended the meeting, was an employee of the Standard Auto Bumper Corporation. EPA has made information on the site available at the local library and the Regional office in Atlanta, Georgia. These files are updated as new material is generated concerning the site. During the Remedial Investigation/Feasibility Study, public interest remained at the same low level. Calls the Agency received regarding the site were from firms conducting environmental assessments on nearby properties. These callers wanted to know the extent of contamination at the site. The Agency's response was that contaminated soil was found on properties adjacent to the Standard Auto Bumper property and that the extent of groundwater contamination had not been ascertained.

C. SUMMARY OF COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD AND AGENCY RESPONSES

EPA mailed the Proposed Plan to approximately 450 people in the media, community, and government on August 3, 1992. The public comment period on the Feasibility Study and Proposed Plan for the site was held from August 7 to September 6, 1992. All comments from the community were received during the public meeting on August 18, 1992, at the Henry M. Filer Middle/Community School in Hialeah, Florida. The purpose of the meeting was to present EPA's preferred alternative. This meeting was attended by three citizens. Part I of this section addresses the community's questions; Part II addresses the State's comments received after the public meeting. No comments have been received from the PRP. A summary of the comments or questions and EPA's response to those comments or questions is set out below.

Part I - Summary and Response to Local Community Concerns

1. Who pays for the cleanup?

EPA Response: The EPA Superfund provides the money; however, the fund is reimbursed. EPA recovers the costs from the PRP, Standard Auto Bumper, through the justice system.

2. At the public meeting a student asked how stable the solidified soils will be and who's responsible for monitoring the material.

EPA Response: It was explained that EPA performed a treatability study on the contaminated soil and successfully solidified the material as shown by the Toxicity Characteristic Leaching Procedure. This procedure measures the levels of contaminants leaching from the hardened monolith. The leach levels for the solidified soil were below regulatory levels, indicating the solidification was effective. However, EPA will perform another treatability test prior to the cleanup. EPA further explained stabilization/solidification is a common and reliable remedy for metal-contaminated soil. The process solidifies the soil into a mass very similar to concrete, preventing the soil contaminants from leaching into the groundwater. EPA considers this technology to be protective of the groundwater at the site. It was added that solidification will enhance natural attenuation of groundwater contamination, and groundwater sampling has indicated much lower levels of contaminants during subsequent sampling events. In conclusion, EPA explained that should this remedy be selected, they will monitor the remedy for the first year following cleanup and then the State will assume responsibility.

Part II - Summary and Response to the State of Florida's Concerns

1. Staff at the Florida Department of Environmental Regulation (FDER) disagreed with EPA's preferred alternative of excavation, stabilization/solidification, and groundwater monitoring. FDER staff suggested that the longterm monitoring was excessive and that this requirement could be avoided by selecting a comparable alternative, excavation and offsite disposal. This alternative did not require long-term operation and maintenance (O&M).

EPA Response: The alternative EPA recommended at the public meeting (excavation, onsite stabilization/solidification, and groundwater monitoring) was favored mainly due to the Superfund statutory preference to employ treatment to reduce toxicity, mobility, or volume as a principal element. However, EPA determined that the staff at the State had valid concerns regarding the burdensome long-term O&M commitments necessary for the stabilization/solidification alternative. EPA resolved that at this site it was not preferable to utilize treatment to reduce toxicity, mobility, or volume, because the soil is not a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) and is a relatively small volume, approximately 2500 cubic yards. Excavation and offsite disposal was then selected as a remedy that utilizes permanent technologies and alternative treatment technologies, to the maximum extent practicable for this site. Up to five years of groundwater monitoring will be required following offsite disposal. Excavation and offsite disposal was the remedy selected in the ROD, which contains further details of the process for selecting the remedial alternative.

D. REMAINING CONCERNS

EPA is mainly concerned with the abatement of any groundwater contamination by cleaning up the soils, the source of the contamination. Future testing of the groundwater during the RI/FS for operable unit two, groundwater, will define the nature and extent of any groundwater contamination. EPA is confident that the selected alternative will minimize the need for groundwater pumping and treatment. EPA plans to keep the public and local officials informed of the activities that the Agency is undertaking at the site along with any new information that may involve the site. EPA will issue another Proposed Plan for the preferred groundwater alternative for operable unit two.

APPENDIX B

6.4.1.1 On-Site Worker Assumptions

Exposure factors chosen for the on-site worker in conducting this exposure assessment come from the EPA reference documents cited earlier and are listed below.

- Based upon information in the EPA document, Exposure Factors Handbook (EPA 1989b), the recommended BW for adults is 70 kg. This factor is also a Standard Default Exposure Factor for Commercial/Industrial Land use according to EPA guidance. Therefore, this factor is selected for use in assessing the exposure to on-site workers.

- The Standard Default Exposure Factor for Commercial/Industrial Land use in determining the exposure frequency (EF) is 250 days/year according to EPA guidance. Therefore, this factor is selected for use in assessing the exposure to on-site workers.

- The Standard Default Exposure Factor for Commercial/Industrial Land use in determining the exposure duration (ED) is 25 years according to EPA guidance. Therefore, this factor is selected for use in assessing the exposure to on-site workers.

- For noncarcinogenic chemicals, average time (AT) is calculated by averaging 365 days/year over a period of 25 years to yield an AT of 9,125 days. For carcinogens, intakes are calculated by averaging the total cumulative dose over a 70-year lifetime, yielding a carcinogenic AT of 25,550 days.

- Available exposed skin area for an onsite worker was assumed to be limited to the head and hands. According to the Exposure Factors Handbook, March 1990, this area for an adult male would be approximately 2,000 cm^2.

All exposure parameter values for the onsite worker scenario are listed in Table 6-1. The intake factor formulas for each pathway-specific exposure and the intake factor value is included in Table 6-2.

6.4.1.2 Site Visitor

For purposes of assessing potential health risks associated with exposure to a site visitor, the site visitor is assumed to be a youth between the ages of 9 and 18. The exposure assumptions are itemized below.

- Based upon information in the EPA document, Exposure Factors Handbook (EPA 1989b) the average BW for male youths between the ages of 9 and 18 is 50.5 kg. Based on professional judgement, this BW will be utilized for the site visitor in assessing exposure.

- The site visitor is assumed to visit the site for 8 hours/visit. This assumption is a professional judgement based upon the size of the site and the general composition of the site layout and features. Based on professional judgement, this EF will be utilized for the site visitor as the ET in assessing exposure.

- The site visitor is assumed to visit the site 1 day/week for 9 months/year or 39 days/year. Based on professional judgement, EF will be utilized for the site visitor in assessing exposure.

- The ED for the ages 9 to 18 is 10 years.

- For noncarcinogenic chemicals, AT is calculated by averaging 365 days/year over a period of 10 years to yield an AT of 3,650 days. For carcinogens, intakes are calculated by averaging the total cumulative dose over a 70-year lifetime, yielding a carcinogenic AT of 25,550 days.

- Available exposed skin area for the site visitor was assumed to be limited to the head, hands, forearms, and lower legs. According to the Exposure Factors Handbook, March 1990, this area for an adult male would be approximately 5,300 cm^2.

All values for the site visitor scenario is listed in Table 6-3. The intake factor formulas for each pathway-specific exposure and the intake factor value is included in Table 6-4.

6.4.1.3 Hypothetical Residential Exposure Assumptions

Exposure factors chosen for the hypothetical future residents in conducting the hypothetical future resident assumptions will consider both an adult and a child scenario. The adult scenario will be considered for all exposure pathways cited in Section 6.1.4. The child scenario will be considered for the incidental ingestion and dermal contact of soils pathway as these are considered the most significant pathway concerning children. This exposure assessment is derived from the EPA reference documents cited earlier and are as follows:

- The body weights for the adult and child is 70 kg and 15 kg, respectively, in accordance with the guidance in EPA's Human Health Evaluation Manual, Supplemental Guidance, "Standard Default Exposure Factors" (1991).

- The EF to be utilized according to the EPA's Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A) is 365 days/year. However, according to the EPA's Human Health Evaluation Manual, Supplemental Guidance, "Standard Default Exposure Factors" (1991) this value is too conservative and recommends a Standard Default Exposure Factor of 350 days/year, which assumes the individual is at home all but 15 days/year. This value will be utilized in assessing exposure to the hypothetical future resident.

- Based upon information in the EPA document, Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A), Interim Final (1989), the 90th percentile national upperbound time at a single residence is 30 years. EPA guidance states that the 90^{th} percentile values should be used if 95th percentile values are unavailable. Therefore, this value will be utilized as the ED in assessing exposure to the hypothetical future resident. The ED for the child will be 6 years.

- Available exposed skin area for the adult hypothetical future residents will be assumed to be limited to the head, hands, forearms and lower legs. According to the Exposure Factors Handbook, March 1990, this area for an adult male would be approximately 5,300 cm[2]. The child will include head, hands, arms and legs which would be approximately 5,000 cm[2].

- For noncarcinogenic chemicals, the adult scenario's AT is calculated by averaging 365 days/year over a period of 30 years to yield an AT of 10,950 days. For carcinogens, intakes are calculated by averaging the total cumulative dose over a 70-year lifetime, yielding a carcinogenic AT of 25,550 days.

- For noncarcinogenic chemicals, AT for the child scenario is calculated by averaging 365 days/year over a period of 6 years to yield an AT of 2,190 days. Carcinogenic intakes will not be considered in the child scenario because the purpose in assessing carcinogenic risk is to evaluate the long-term effects of exposure. Further, slope factors are based upon 70 years of exposure and therefore is inappropriate for the evaluation of children.

All values for the hypothetical future residents are listed in Tables 6-5 and 6-7. The intake factor formulas for each pathway-specific exposure and the intake factor value is included in Tables 6-6 and 6-8.

APPENDIX C